



**US Army Corps
of Engineers®**
Engineer Research and
Development Center

Periodic Inspections of Coastal Structures

Description



T-LiDar Survey of Kaumalapau Harbor breakwater, Hawaii

The Corps manages over 1,000 coastal navigation structures. The majority of these structures have exceeded their design life, and most have been repaired multiple times. Many of these structures have deteriorated but are still functioning adequately. Many contain innovative components such as concrete armoring, porous caps, steep slopes, marine mattresses, berms, or other unique features. There exists no long-term detailed standardized monitoring of this infrastructure, and no formalized program for capturing and disseminating lessons learned. With recent reductions in monitoring and repair funding, it is crucial that long-term performance of coastal navigation infrastructure be documented and disseminated in a standardized manner.

Issue

It is essential to gather, analyze, and archive detailed coastal structure condition, performance, and response data on a relatively small number of coastal navigation structures that are characteristic of a larger class, or that have some unique or innovative characteristics. Relatively low-cost remote sensing tools and techniques, with limited ground-truthing surveys, are the primary inspection tools used in the periodic monitoring efforts. Most periodic inspections consist of capturing above-water conditions of the structures at periodic intervals using high-resolution aerial photography or lidar surveys coupled with walking inspections. General monitoring techniques include lidar or photogrammetric surveys, bathymetric sonar surveys, conventional ground surveys, walking inspections, and damage surveys that are more comprehensive than typical field inspections. The data are compared to historical data and to standard design methods in order to improve designs. Data are stored in GIS layers and databases, and technology transfer is via Technical Reports, archived data sets, and web-based GIS and Google Earth applications.

ERDC Coastal and Hydraulics Laboratory is the lead lab, and each survey is supported by Corps Districts. Lidar surveys are coordinated with Corps and national mapping initiatives.

In 2007-2008, the Periodic Inspections work unit transited from a paper reporting and archive system to digital GIS with database data storage. A centralized Corps-wide database with Google Earth map interface was developed to permit easy access to the data. The database is the Enterprise Coastal Inventory Database (ECID), and both the search engine and map interface can be accessed at website

<http://chl.erdc.usace.army.mil/ecid>.

Users

Corps Districts and Divisions

Benefits & Products

Field survey reports, Technical Reports, Engineering Technical Notes, and web-based GIS and Google Earth applications.

Detailed knowledge about a wide range of unique coastal infrastructure features for ascertaining long-term performance and durability data for use in Condition Index determination, and for making Asset Management rehabilitation decisions.

Point of Contact

Principal Investigator is Jeffrey A. Melby, PhD, ERDC Coastal and Hydraulics Laboratory, CEERD-HN-HS, 3909 Halls Ferry Road, Vicksburg, MS 39180, 601-634-2062, Jeffrey.A.Melby@usace.army.mil. Additional information can be found at <http://chl.erdc.usace.army.mil>.